

On the non-deictic use of Japanese demonstratives

Ryoichi TSUTSUMI

1. Introduction

Japanese has three distinct morphemes which form demonstratives with other morphemes. They are the *ko-*, *so-* and *a-*series, respectively. In this paper I will refer to them as *ko-*, *so-*, *a-*NPs following Hoji et al. (2003). Some examples of Japanese demonstratives are shown in (1) below.

- (1) a.*Ko-* series: *ko-no* (this, used as an adjective), *ko-re* (this, used as a pronoun), *ko-ko* (here), *ko-n-na* (like this).....
- b.*So-*series: *so-no* (that, adjective), *so-re* (that, pronoun), *so-ko* (there), *so-n-na* (like that).....
- c.*A-*series : *a-no* (that, adjective), *a-re* (that, pronoun), *a-soko* (there), *a-n-na* (like that)...

Ko-, *so-*, *a-*NPs can be used in both *deictic* and *non-deictic* usages. These concepts are defined as follows (Hoji et al. (2003:97)).

- (2) a.A deictic use is such that the object being referred to is visible in the speech location.
- b.A non-deictic use is such that the object being referred to is not visible in the speech location.

Deictic use is characterized as in (3), following Matsushita (1978:233-235) [originally published in 1930]. (The translation is cited from Hoji et al. (2003:97).)

- (3) The standard characterization of the deictic uses of *ko/so/a*-NPs:
 - a. A *ko*-NP is used for referring to something near the speaker.
 - b. A *so*-NP is used for referring to something closer to the hearer.
 - c. An *a*-NP is used for referring to something at a distance from both the speaker and the hearer.

(Hoji et al. (2003:97))

One of the standard characterizations for non-deictic uses of *so*, *a*-NPs is Kuno's (1973), where they are distinguished based on the speaker's and hearer's knowledge.

(4) Kuno's characterization of the non-deictic uses of *so*, *a*-NPs.

- a. The *so*-series is used for referring to something that is not known personally to either the speaker or the hearer or has not been a shared experience between them.
- b. The *a*-series is used for referring to something (at a distance either in time or space) that the speakers knows both he and the hearer know personally of have shared experience in.

(Kuno (1973:290))

This paper presents a model which explains a wide range of demonstratives in non-deictic uses. The next chapter discusses what has been said about the field. In chapter 3, I present a model for demonstratives following Takubo and Kinsui (1996). Chapter 4 considers the data and how it can be explained in our framework. Chapter 5 is a concluding remark.

Although Kuno's characterization of non-deictic uses of *so*, *a*-NPs was influential, it cannot be related to the deictic characterization in (3). Kuno (1973:288) notes;

- (5) I have shown that when they are used anaphorically, the *so*-series and the *a*-series lose their original meaning of "closer to the hearer than to the speaker" and "at a distance both from the speaker and the hearer."

Kuno (1973:288)

This is to say, non-deictic uses should be independently considered from deictic uses (see also Kuroda (1979:92-3), Takubo and Kinsui (1996:68) and Tsutsumi (2003:23-4)). I will mainly discuss the validity of the model in non-deictic uses. However, it has a good possibility to cover deictic-uses as well. Some brief note will appear in the final chapter.

2. A brief review of what has been said about demonstratives

2.1. *Ko*-NPs and *a*-NPs vs. *so*-NPs. (A review of Hoji et al. (2003))

Recent studies have revealed that *ko*-NPs and *a*-NPs belong to one group and *so*-NPs to another.

Hoji et al. (2003) argues that *ko*-NPs and *a*-NPs "can refer to an individual which is known to the speaker by direct experience" while *so*-NPs cannot. Let us consider the data given in Hoji et al. (2003:100, 103):

- (6) (Situation: The detective is looking for a man. He somehow believes that the man should be hiding in a certain room. He breaks into the room and asks the people there.)

[*Aitu/#Soitu*]-wa do-ko-da?

that-guy-TOP which-place-COPULA

'Where is [**he**]?

(Hoji et al. (2003:100))

- (7) (Situation: The president of a company has called an executive meeting regarding a certain important project. As soon as everyone has arrived, he directly plunged into the issue.)

Buraun-kun, [{*ko-no/#so-no*} *purozyekuto*]-wa itu hazemaru-nokane?

Brown-Mr. this-GEN/that-GEN project-TOP when start-Q

'When will **this project** start, Mr. Brown?

(ibid.:103)

The point is that when the speaker knows what is referred to by the NPs, *ko*-, *a*-NPs can directly refer to the individuals. On the other hand, *so*-NPs cannot do so even when he/she knows what the NPs refer to. Hoji et al. (2003:98) based on Ueyama (1998), treats *ko*-, *a*- NPs as D-indexed NPs. According to Hoji et al., "a D-indexed NP is strictly 'referential' and it has to be understood in connection with a specific individual known to the speaker. (p.98)" With this and (6,7) above they advocate (8):

- (8) a. A *ko*-NP must be D-indexed.

b. A *so*-NP cannot be D-indexed (at least when the target object is not visible at the scene)

c. An *a*-NP must be D-indexed.

(Hoji et al. (2003:98))

For us, the crucial point is that *ko*-NPs and *a*-NPs are "directly referential" while *so*-NPs are "indirectly referential." I will use these terms instead of "D-index" with the definitions which appear later in section 3.3.

2.2. *so*-NPs

Ko-NPs and *a*-NPs are directly referential while *so*-NPs are not. In the next section I will define more clearly what "directly referential" means after I present my model, but in brief the idea is that a noun α is understood by making a direct link to an individual object of the world. (9a) is an example of this. If we see this relation as a function, we get (9b) where α is a noun, β an individual of the world, and $f(\alpha)$ is a function from a linguistic expression to an individual that is denoted by α .

- (9) a. $\alpha \xrightarrow{\hspace{10em}} \beta$
 b. $f(\alpha) = \beta$

From this formula a question arises: What is "indirectly referential"? How can it be defined? Ueyama (2000:173) makes a descriptive generalization of indirect reference as in (10):

- (10) *So*-series demonstratives become understandable by having a **linguistic relation** with other expression when no visible object is at the place of uttering. (Ueyama (2000:173))

This means that a *so*-NP requires a linguistic antecedent, at least when the object referred to is not visible to the speaker. Further, it means that a *so*-NP gets its meaning by being bound by its antecedent. This sort of elements is often assumed as a variable. Tsutsumi (1998) takes this way of discussions and concludes that *so*-NPs introduce variables in SR (semantic representation). Let us look at some discussions from Tsutsumi (1998).

Tsutsumi (1998) follows Kamp (1981), Heim (1982) and Diesing (1992) and assumes that every indefinite introduces a variable. (11) is a quotation and (12) is an example from Diesing (1992:7).

- (11) indefinites are not inherently quantified, but merely introduce variables into the logical representation....They must receive quantificational force by being bound by some other operator.

- (12) a. Every llama ate a banana.
 b. $\text{Every}_x[x \text{ is a llama}] \exists_y[y \text{ is a banana}] \wedge x \text{ ate } y$

Diesing (1992:7)

In (12) the indefinites "llama" and "banana" get quantificational force from outside by being

bound by the operators "every" and " \exists " (the existential operator) respectively. Now, if Kamp-Heim-Diesing's theory is correct and applicable to Japanese, Japanese quantifier "ookuno (many)" binds a variable which is introduced by the complement noun. Thus;

- (13) a. Ookuno hitsuji
 many-GEN sheep
 b. ookuno, [x is a sheep]¹

Now, let us see the example below.

- (14) Taro-wa ooku-no hitsuji-wo katteiru. Hanako-wa (sono/*kono) hitsuji-ni esa-wo
 Taro-TOP many-GEN sheep-ACC own-GER. Hanako-TOP (this/*that) sheep-to food-ACC
 yaru.
 feed-
 Taro owns many sheep. Hanako feeds them.

If we follow Ueyama (2000)'s claim given in (10), "sono hitsuji (the sheep)" must have some relation to its antecedent "ookuno hitsuji (many sheep)." To establish this relation, "sono hitsuji" should also introduce a variable².

Let us look at further examples which show that *so*-NPs are variables. Under the environment where the antecedent is non-specific, a *so*-NP, not a *ko*-NP can be used. This is considered to be so because a non-specific element cannot refer directly to a specific individual. Variables suit to express this sort of meaning.

- (15) a. Watashi-wa kyou kono kouen-de, kono mae-no orinpikku-no yuushousha-no hitori-to
 I-TOP today this park-at, this before-GEN Olympic-GEN winner-GEN one-with
 au-koto-ni-natteiru. (Sono/*Kono) hito-wa koko-made hashitte kuru-souda.
 meet-be planned. (That/*This) person-TOP here-to run come-I hear.
 Today, I am going to see one of the winners of the last Olympic game here at this park. I

*1 I will use a "mixed" notation as in (13b) for the meta language henceforth.

*2 More precisely, "sono hitsuji" is interpreted as an E-type pronoun. Therefore, its interpretation is not "many sheep" but "every sheep that Taro owns." I will put aside this problem, but see Evans (1980), Heim (1982) among many others.

hear that he is running here.

b.Watashi-wa kyou kono kouen-de, kotoshi-no Biwako marason-no yuushousha
I-TOP today this park-at, this year-GEN Biwako marathon-GEN winner
(*-no hitori) -to au koto-ni-natteiru. (Sono/Kono) hito-wa koko-made hashitte
(*-GEN one) -with meet be-planned. (That/*This) person-TOP here-to run
kuru-souda.
come-I hear.

Today, I am going to see (*one of) this year's winner of the Biwako marathon. I hear
that she/he is running to here.

(Tsutsumi (1998:49, slightly modified))

In (15b), the number of "Biwako marason-no yuushousha (the winner at Biwako marathon)" is pragmatically unique. So the antecedent is specific, hence both NPs can be used. On the other hand, in the example (15a), we know that there exist as many winners as the number of games held in the Olympic at the maximum. (15a) only mentions that one of them is coming to the park and does not say exactly who he/she is. In this case, a sharp contrast appears with (15b), in that only *so*-NP, interpreted as a variable, can be used.

The data that Kinsui (1999) presents also indicates that *so*-NPs are interpreted as variables. See (16ab).

(16)a.Gakuseitachi-wa isshoukenmei ronbun-wo kaita. Shikashi kekkyoku daremo sono

Students-TOP hard thesis-ACC wrote. However finally none that
ronbun-wo kyouju-ni teishutsu shinakatta.
thesis-ACC professor submit did not.

Every student worked very hard at writing his thesis. However, no one submitted it to his professor.

(Kinsui (1999:83))

b.Dono kenmin-mo, sono ken-naradewa-no tokusanbutsu-wo

Every inhabitant-of-a-prefecture-also, that prefecture-special-GEN special product-ACC
hokorini omotteiru.
proud think-GER.

Every inhabitant of every prefecture is proud of the special product of his own prefecture.

(17)...by quantificational expressions, the situation itself functions as a codomain. If we

apply this situation to the function of a demonstrative expression "(N (so))", we get a value depending on the codomain. That is, the value is not specific but variable.... (omit) Under the situation where an object is deictically referred to, it is always specific with no possibility of it being a variable. From this fact is clear that ko/a-series demonstratives do not bear distributive interpretations.

(Kinsui (1999:83))

Kinsui (1999) takes Ueyama (1998)'s theory of dependency and advocates that bound variable interpretations should arise when antecedents and its anaphors go into some specific relation which Ueyama names FD(Formal Dependency) and ID(Indexical Dependency). (16ab) are both examples of ID. In any case, to get bound variable interpretations *so*-NPs should be considered as containing variables in them.

If *so*-NPs are variables at some level of interpretation, it is predicted that we find some cases where the referent differs from its antecedent. Tsutsumi (2001, 2002) argues that this is indeed the case.

(18) A: Senjitsu, kimi-to futari-de itta resutoran-ni itta-yo.

A: the other day, you-with two of us-with went restaurant-to went-PART.

B: Iya, sono resutoran-wa bokutachi-ga senjitsu itta yatsu-janai-ne. Datte,

No, that restaurant-TOP we-NOM the other day went one-is-not-PART. because,

asoko-wa sengetsu tsuburete mou sonzai shinai-n-dakara.

there-TOP the other day went bankrupt anymore exist does-not-because.

A: I went to the restaurant that we had gone to the other day.

B: No, that's not the one we went to the other day, because that restaurant went bankrupt and doesn't exist anymore.

(Tsutsumi (2001:218))

(19) a. Kouraku-en-wo hakaishite, soko-ni biru-wo tateyou.

Kouraku-en-ACC destruct-GER, there-at building-ACC build-VOL.

Let's destroy Kouraku-en to build a building there.

b. Monariza-wo gizoushite, sore/soitu-wo uritobasou.

The Mona Lisa-ACC forge-GER, it/it-ACC sell-away-VOL.

Let's forge the Mona Lisa to sell it away.

(Tsutsumi (2002:61))

In (18), "*so-no* Resutoran (the restaurant)" in B's utterance does not refer to the same restaurant

in A's "the restaurant which A went with B the other day." Similarly in (19a), "so-ko(the place/ there), does not refer to "Kourakuen," since the building will be constructed after "Kourakuen" is destroyed. Tsutsumi (2001) thus concludes that *so*-NPs basically do not refer to the same object as their antecedents. Rather, they just take intention from their antecedents. Hence the data (18, 19). When *sono*-NP takes the same referent as its antecedent, the context eliminates the possibilities that it takes other elements as its referents. More crucially for this paper, (18, 19) show that *so*-NPs behave like variables.

In this subsection, we observed four pieces of evidence that *so*-NPs are interpreted as variables. While *ko*-/ *a*-NPs are directly referential, *so*-NPs are indirectly referential. That is to say, they are interpreted via variables in some semantic level.

In section 3, we will present a model for non-deictic NPs.

3. A model

In this section I present a model that can explain the usage of *ko*-, *so*-, *a*-NPs both in the deictic and non-deictic use. Before presenting the model however, we review Kuno's account of anaphoric *so*-, *a*-NPs in 3.1. and Takubo and Kinsui (1996)'s theory in section 3.2. Both have had much impact on the study of demonstratives in Japanese. 3.1. makes a brief comment on what has been said about Kuno (1973)'s descriptive generalization. In 3.2. I will show how Takubo and Kinsui (1996, 1997)'s theory explains the usage of demonstratives. Also, the problems of the theory will be pointed out in the latter part of the subsection. Their theory is a version of the Mental Space of Focaunnier (1985). It treats demonstratives as pointers which search for items in the mental domains of the space. I will follow their basic ideas and construct a model in section 3.3. and explore various data in which demonstratives are used.

3.1. Kuno's account

Kuno (1973) made a familiar generalization about non-deictic use of the demonstratives as in (20).

(20) Kuno (1973:290)'s generalization:

- (i) The *a*-series is used for referring to something (at a distance either in time or space) that the speaker knows both he and the hearer know personally or have shared experience in.
- (ii) The *so*-series is used for referring to something that is not known personally to either the speaker or the hearer or has not been a shared experience between them.

(21) A: Kinou Yamadasan-ni hajimete aimashita. Ano (*sono) hito, zuibun kawatta hito desu-ne.
yesterday Mr. Yamada-to for the first time meet-PAST. that (*that) person, fairly odd
person COP-PART.

B: Ee. Ano (*Sono) hito-wa henjin desu-yo.

yes. that (*that) person-TOP odd person COP-PART.

A: I met Mr. Yamada for the first time yesterday. He is fairly odd, isn't he?

B: That's right. He is indeed an odd person.

(22) Kinou Yamada-toiu hito-ni aimashita. Sono (*Ano) hito, michi-ni mayotte-ita-node,
yesterday Mr. Yamada-named person-to meet-PAST. that (*that) person, road-to
get-lost-GER-PAST-because,
tasukete agemashita.
help-GER give-PAST.

I met a person named Yamada yesterday. He got lost so I showed him the way.

In (21) A, the speaker knows that B knows Yamada. A also knows him hence *ano* is used. (21) B is explained in the same manner. On the contrary in (22), A uses *sono* instead of *ano* despite the fact that he knows Yamada. Kuno claims this is because the hearer to whom A talks to does not know Yamada. This explanation is so familiar that it is still frequently used in the field of teaching Japanese as a second language.

However, a series of counterexamples exists. Kuroda (1979) pointed out that in (23) and (24) *ano* is used in spite of the hearer's lack of knowledge about the fire and the teacher named Yamada Taro.

(23) Kyou Kanda-de kaji-ga atta-yo. Ano/*Sono kaji-no koto-dakara hito-ga nan-nin-mo
today Kanda-at fire-NOM be-PAST-PART. that/*that fire-GEN judging from person-AG
many
shinda-to omou-yo.
die-PAST-COMP think-PART

There was a fire in Kanda today. Judging from that fire, I assume many people died

(24) Boku-wa Osaka-de Yamada Tarou-toiu sensei-ni osowatta-n-dakedo, kimimo

I-TOP Osaka-at Mr. Yamada Tarou-named teacher-to be taught-COP-but, you-too,
ano/sono sensei-ni tsuku-to ii-yo.

that/that teacher-to study-COMP good-PART

I studied with a professor named Mr. Yamada. I'd suggest that you should study with him as well.

If we follow Kuno's generalization, *sono* should be right, since the speaker of (23) supposes that the hearer does not know the fire he mentions. Nevertheless, *ano* is judged more natural than *sono*, contradicting Kuno's proposal. The same is said about (24), where the hearer should not know who Yamada Taro is.

To solve this problem, Kuroda (1979) abandoned the concept "hearer," and the choice of demonstratives is determined by what kind of knowledge the speaker has. That is, if she/he has some knowledge through a direct experience, *ano* is used and if she/he does not have it, *sono* is used. The fact that this description captures the fact far better than Kuno's is certified by the examples above.

Following Kuroda's study appears Takubo and Kinsui (1996). We will look at their study in the next subsection.

3.2. Takubo and Kinsui (1996)

Takubo and Kinsui (1996, 1997) argue that problems about reference and discourse management should be handled with the mental space of the utterer taken into consideration. They argue that this mental space works as a cognitive interface between linguistic expressions and the memory base. They also claim to establish (at least) two separate domains in the space: D (deictic, direct) domain, and I (intentional, indirect) domain. The domains are defined as in (25).

(25) D-domain (linked to the long term memory)

- direct (direct assimilated, digested) information obtained by direct experience or past experience is stored.
- directly accessible.

I-domain (linked to the temporary memory)

- indirect (not yet assimilated, digested) information obtained by hearsay, inference, hypothetical information is stored.
- only indirectly accessible.

(Takubo and Kinsui (1997:748-9))

By these definitions (25), the sentence (26) , which is a repetition of (23), is clearly explained.

- (26) Kyou Kanda-de kaji-ga atta-yo. Ano/*Sono kaji-no koto-dakara hito-ga nan-nin-mo
today Kanda-at fire-AG be-PAST-PART. that/*that fire-GEN judging from person-AG many
shinda-to omou-yo.
die-PAST-COMP think-PART
There was a fire in Kanda today. Judging from that fire, I assume many people died
(Takubo and Kinsui (1997:753), originally appears in Kuroda (1979))

The expression "*N-no kotodakara* (judging from the nature of N,)" is properly used when the proposition following it is naturally inferred by the nature of N. Thus in (26), to lead a conclusion "*hito-ga nannin-mo shinda-to omou-yo* (I guess a lot of people must have died)," "*kaji* (fire)" should be harsh. In the case where *sono* is used, how the fire was cannot be inferred because, by the definition (25), it is an indirect information to the utterer, that is, the information is obtained not by her/his direct experience. On the contrary, the case where "ano" is used is appropriate since the utterer experienced the fire and she/he can make a judgment that many people must have died.

Note that this explanation crucially depends on the notion "(direct) experience." However, Takubo and Kinsui (1996) does not make an exact definition of what "experience" is. Further, (27),(28) can be counterexamples to their theory if we interpret "experience" in an ordinary way.

- (27) A: "Dare-mo shiranai" mita?

"Nobody knows" see-PAST?

Have you seen the movie "Nobody Knows"?

B: Iya, ano/sono eiga-wa mada mite-nai.

no, that/that movie-TOP yet see-NEG.

No, I have not seen it yet.

- (28)tokorode, konaida ----- no shiriai-ga Burajiru-ni gakkai-ni kuru-tte itteta-yaro? Ano hito
Yuuko-san-tte iu hito? Watashi-ga yasumi-datta hi-ni, denwa kakete-kita hito-ga
ita-rashikute, sono hito-ga Yuuko-san-tte iu-rashii-nen-kedo, shiriai-ni sono namae-no hito
inai-kara-sa

Anyway, the other day you mentioned that your acquaintance would come to Brazil for a conference, didn't you? Is the name of her "Yuuko"? I'm asking this because I was told that someone whose name was Yuuko had called me while I was on a vacation. You know

what? I don't know any Yuuko.

In (27) B, "*ano*" can be perfectly used under a situation where the utterer B knows the movie (or rather, he might only know the name of the movie) by a commercial on TV, on magazine or by a unreliable information from his/her friend or family member. The speaker of (27) B says that he/she has not seen the movie yet, which means that he used "*ano*" without "direct experience" of seeing the movie. In the same way, the sender of this mail has not met the person she mentions by "*ano hito* (that person)" before she wrote (28). That is to say, "*ano*" in (27), (28) are used without utterer's direct experience. It seems difficult to define the concept of "(direct) experience" so that it can handle the examples above.

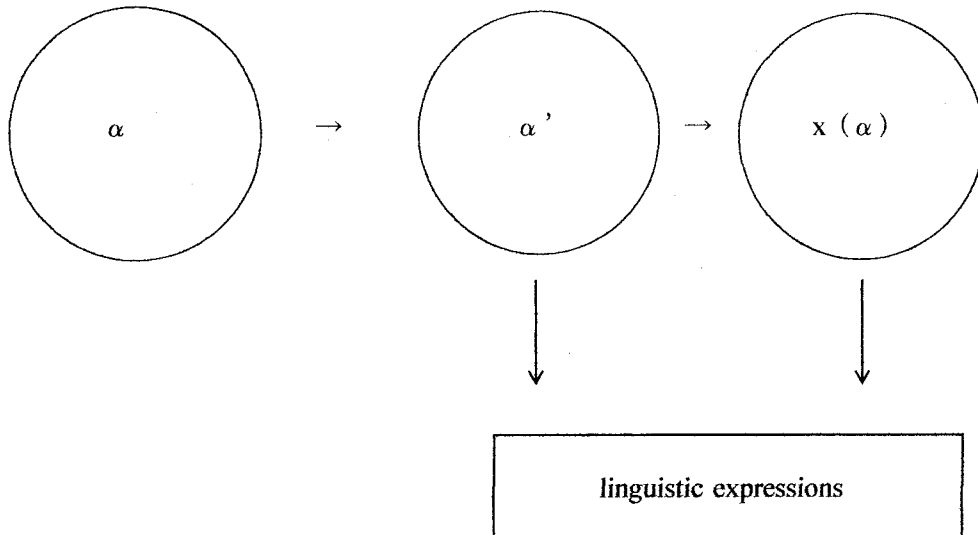
Takubo and Kinsui (1996)'s theory developed the theory of Japanese demonstratives, advocating the existence of the distinct two domains in our mind, but their definition should still be considered. In the next section, a model from a different point of view is presented, where the concept "experience" is abandoned and direct/ indirect reference and variables are introduced.

3.3. the alternate model

We have seen that Kuno (1973)'s explanation cannot explain some data, and neither can Takubo and Kinsui (1996)'s. In this section, I present a model which seems to be able to deal with the problematic data such as the ones shown in the sections above.

I follow Takubo and Kinsui (1996)'s claim that there are at least two separate mental domains working as a data base where objects are registered and used while a discourse goes on. I call these *Ws* and *Wp*, respectively. *Ws* is such that an element in it is referential while *Wp* is such that an element in it is not referential. In *Wp*, it is transferred to a variable. The outer world is interpreted through our senses and reconstructed in our mind as *Wo*. We register the objects of *Wo* into *Ws* and *Wp* so that we can use them in a language. *Ws* and *Wp* are the interface between the world and the language. The image of this is shown as in (29) below.

(29) Wo



For example, let us assume an object α is in the outer world and recognized by the speaker. It then is in Wo. When the speaker wants to mention α in the language he/she is speaking, he/she registers it into Ws as α' . For some reason, which I will argue in section 4, α' is transferred into Wp, this time converted to a variable shown in (29). α' is a rigid designator in Kripke (1972)'s sense.

Now, let us see how our system works.

(30) Yamada Taro-wa Okayama-ni sunde-iru.

Yamada Taro-TOP Okayama-in live-GER-PAST.

Yamada Taro lives in Okayama.

In (30), the proper noun "Yamada Taro" and "Okayama" are registered into Ws. If not necessary, they do not enter Wp. Since proper nouns are rigid designator, they do not need to be transferred into Wp (but see section 4).

Unlike proper nouns, indefinites always introduce variables, if we assume Kamp (1981), Heim (1982), Diesing (1992) and the discussion in 2.2 above. This means that in our theory, they have to be registered in Wp.

(31) Mukashi, aru tokoro-ni ojiisan-ga sunde-imashita.

Once upon a time, a place-in old man-AG live-GER-PAST

Once upon a time, there lived an old man.

"Ojiisan (an old man)" in (31) goes from *Wo* to *Ws*, and then to *Wp*. In *Ws*, "ojiisan" gets D-indexed arbitrarily in Ueyama (1998)'s term. This is different from the case of (30), where D-indexed proper nouns are introduced. That is, they are considered as inherently carrying fixed indices before entering *Ws* (see Ueyama (1998:4.3.1) where she takes these indices (numbers) as existing outside Grammar). Contrarily, indefinites get arbitrary indices at each time they are registered (i.e., they get different indices at each different conversation).

In section 2.1., I used the terms "direct reference" and "indirect reference" without any definition. Assuming this model, they are defined as follows.

(32) direct reference:

A reference using an element within *Ws*.

indirect reference:

A reference using an element within *Wp*.

In section 2.1. and 2.2., I made a claim that while *ko*-NPs and *a*-NPs are directly referential, *so*-NPs are indirectly referential. This, together with (32) above, leads us to another claim described in (33).

(33) a. *Ko*-NPs and *a*-NPs take elements registered in *Ws* as their referents.

b. *So*-NPs take elements registered in *Wp* as their referents.

(33) is what I find to be the basic function of *ko*-, *so*-, *a*- in Japanese.

(28) bears a prediction (34).

(34) a. If an element corresponding to the denotation of α is registered in *Ws*, *ko*- and *a*-NPs can be used.

b. If an element corresponding to the denotation of α is registered in *Wp*, *so*-NPs can be used.

In the next section, we will see that this prediction is borne out.

4. Data

The prediction in (34) can be rewritten in the following way (\sim in (35) is read as "the element is not in").

- (35) a. Ws/ Wp: *ko-/ so-/ a-*
 b. Ws/ ~Wp: *ko-/ *so-/ a-*
 c. ~Ws/ Wp: **ko-/ so-/ *a-*

In the following sections, I will give the data of each pattern. First I will show the data of nondeictic where basically *ko*-NPs and *so*-NPs are used (Iori (1995), Haruki (1992)).

4.1. Ws/ Wp: *ko-/ so-*

As I mentioned in section 3.3., elements in *Wo* are registered into both *Ws* and *Wp* if they are indefinites.

- (36) Mukashi mukashi, aru tokoro-ni ojiisan-ga sunde-imashita. Kono/sono ojiisan-wa
 once upon a time, a place-in old man-NOM live-GER-PAST. this/that old man-TOP
 aruhi yama-e shibakari-ni ikimashita.
 one day mountain-to firewood gathering-to go-PAST.
 Once upon a time, there lived an old man. One day, he went to the mountain for firewood
 gathering.

- (37) Boku-wa kinou seikyou-de zenzai-wo tabeta-kedo, kono/sono zenzai-wa oishikatta-yo.
 I-TOP yesterday COOP-at zenzai-ACC eat-PAST-though, this/that zenzai-TOP
 tasty-PAST-PART.
 I had zenzai at the COOP cafeteria yesterday. It was good.

As we predicted in (35), both *ko-/so*-NPs are used. Note that indefinites always introduce variables (Kamp (1981), Heim (1982), Diesing (1992)). They are represented as in (38).

- (38) a. $\exists x[x \text{ (ojiisan)}]$
 b. $\exists y[y \text{ (zenzai)}]$

In addition, "ojiisan" in (36) and "zenzai" in (37) get D-indexed in *Ws* and become a sort of "rigid designators." These D-indexed nouns are "rigid" only for the speaker. In Tsutsumi (1998)'s sense, they are "referential only for the speaker." This will be crucial for the discussion in this

section. This idea of D-indexing to indefinite nouns is a departure from Ueyama (1998)'s original system. However, our system calls for this procedure once we posit the existence of Ws and every element in it should be like a proper noun. Now for instance, "ojiisan" and "zenzai" get numbers (indicis) as in (39).

- (39) a. [ojiisan]_{D-121}
 b. [zenzai]_{D-38}

In these cases, the choice between *ko*- and *so*-NPs depend on the speaker who uses them as Horiguchi (1978), Kuroda (1979), Kinsui and Takubo (1990) claim. Nuances they carry are of course different. If a *so*-NP is used, a variable is introduced into the semantic representation, which only works as an anaphor to its antecedent. As a result, it indicates that the noun with *so*-NP refers to the same item as its antecedent. Horiguchi (1978, 1990)'s claim that a reference with a *so*-NP is "*heisei shiji* (= a cool reference^{*3})" can be considered to capture this function of "*so*".

On the contrary, a *ko*-NP expresses "*kyouretsu shiji* (=a hot reference); (Horiguchi (1990)," which has a nuance that "the speaker takes the referent as if she/he possessed it (Horiguchi (1978)" or ((a *ko*-NP) is taken to be a discourse topic (Sho-ho (1981), Iori (1995)). In the framework in the paper, these are because indefinites with *ko*-NPs are D-indexed (temporarily) by the speaker (arbitrarily), this procedure is taken by the hearer (or the reader) as the referents belong to the speaker.

Note however that *ko*-/ *so*- are not always interchangeable even if NPs they attach to are indefinites. When the speaker takes what his/ her companion mentioned as the antecedent, only *so*-NPs can be used.

- (40) A: Boku-no tomodachi-ni Yamada-toiu hito-ga iru-n-desuga, kono otoko-wa
 I-GEN friend-LOC Yamada-named person-AG be-though, this man-TOP
 nakanakano rironka-de.....
 quite theorist-be
 A: I have a friend named Yamada. He is quite a theorist and....
 B: (Sono/??Kono) hito-wa nansai kurai-no hito-desuka?
 that/this person-TOP how-old about-GEN person-be-Q

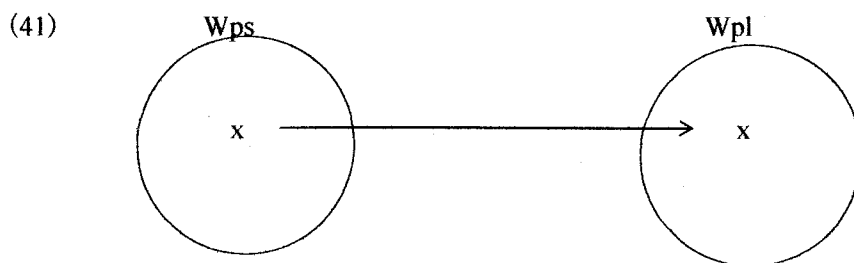
*3 I used here the term "cool," citing Horiguchi (1979:90).

At this point, the listener's model should be taken into consideration. Let us distinguish the speaker A's model and B's by indicating as $W_s(A)/W_p(A)$, $W_s(B)/W_p(B)$, respectively. A's utterance (40)A adds "*Yamada-toiu-hito* (a person named Yamada)" to $W_o(B)$. In other words, (40)A itself works like $W_o(B)$. B then registers "Yamada" into his/her $W_s(B)$ and $W_p(B)$ so that he/she can use it in his/her utterance. Now, the index put to "Yamada" in $W_s(B)$ should be different from that in $W_s(A)$. To avoid this mismatch, B has to use "*sono-hito* (the person)" instead of "*kono-hito* (this person)."

With respect to this, so-called "mutual knowledge" becomes a problem. In (40), A knows that B does not know "Yamada." In such a situation, "*-toiu* (named-)" has to be used in Japanese. However, A's knowledge about B's knowledge is not enough according to Takubo and Kinsui (1996) among others. On B's side, B's knowledge is such that "B knows that A knows B does not know Yamada." Then, A has to know this information. Again, B knows that..... In this way, we fall into infinite regress.

Togo (2000)'s model solves this difficulty by claiming that a speaker *supposes* that his/ her listener knows that P. That is, the listener's knowledge of a speaker is just his/her supposition and not a fact in the real world. He also discusses that the condition Clark and Marshall posed is from "God's point of view" which is not necessary in an actual discourse. Instead, what is needed is the one-sided speaker's assumption (p.41). I follow Togo's conclusion for the rest of this paper.

With this in mind, suppose speakers can add a listener's model to his/ her mental domain when it is necessary. Let us call it as W_{pl} . Suppose further that the elements in the listener's domain are transferred from the speaker's domain.



Once we take this claim to be true, W_{sl} (i.e., W_s of the listener which the speaker creates in his/her own domain) is excluded from the model because the listener's model (in the speaker's domain) is built with the speaker's SUPPOSITION and is not a "real" knowledge of the listener. What is supposed is what the speaker cannot make it specify or D-index to it. Hence only W_{pl} is

needed.

In this model, "mutual knowledge" is represented as in (42).

(42) Mutual knowledge: A speaker *supposes* his/her listener knows x iff $[x]^{Wps} \wedge [x]^{Wpl}$.

Notice this claim does not contradict Takubo and Kinsui (1996)'s generalization that the description of how a linguistic form is used should not contain the listener's knowledge^{*4}.

"-toiu" in (35A) has a function to transfer $[x]^{Wps}$ onto Wpl . Once $[x]^{Wpl}$, then the speaker can use "*kono*" since $[Yamada]^{Wps}$. At the same time, the speaker can use "*sono*." This is because $[x]^{Wps}$ it is easier to calculate for the listener.

4.2. $Ws/\sim Wp$: *ko-/so-*

Proper nouns work as rigid designators in our model. This means that they carry fixed D-indices whenever they are registered in Ws . Compare with the case of indefinites where D-indices are added when they go into Ws . Rigid designators are such that they refer to the same individual in all the possible worlds (Kripke (1972)). As a result, they need not be registered in Wp , for they do not have the possibility of changing their referents. In other words, a registration of proper nouns to Wp brings about a less economical, redundant procedure in the linguistic calculation.

Let us see some examples.

- (43) Daiana moto-ohi-ga nakunarimashita. Kono (Ano)/*Sono ohi-wa yappari rekishi-ni
ex-princess Diana-NOM die-PAST. this (that)/*that princess-TOP after all history-in
nokoru idai-na jinbutsu-datta-yone.
remain great person-PAST-PART
The ex-princess Diana passed away. After all she was a great person who will last in history.

- (44) Konaida-no "Knight Scoop!" mita? Kono (Ano)/*sono bangumi,
the other day-GEN "Knight Scoop!" see-PAST this (that)/*that program,
kondo gooruden-ni shinshutu-suru-rashii-yo.
next time golden time-to advance-I hear-PART

*4 Takubo and Kinsui (1996:62) rejects "the assumption," too. They seem to consider that this assumption also falls into unlimited trace-back, which is not true. See Togo (2000).

Did you watch "Knight Scoop!" the other day? The program will be moving into prime time, from what I hear.

In (43) (44), both *kono-* and *ano-* can be used. What is crucial to the discussion here is that *sono-* is not allowed. This is explained in our theory as follows. Because the antecedents "*Daiana-moto-ouhi* (Princess Diana)" and "*Naito Sukuupu* (Knight Scoop)" are proper nouns, they do not introduce variables in Wp, which causes unavailability of *sono-*.

However, there exists some data in which *sono-* can be used as an anaphor whose antecedent is a proper noun.

(45) *Daiana moto-ohi-ga nakunarimashita. Kono/?-??sono ohi-wa*
exprincess Diana-NOM die-PAST. this/?-??that princess-TOP
sekaiheiwa-ni koukenshita-no-wo shitteru?
world peace-for contribute-Nominalizer-ACC know-GER?

The ex-princess Diana passed away. Do you know that she made a large contribution to world peace?

(46) *Konaida "kururi"-no raibu-ni itta-yo. Kono/?-??sono bando-wa kyoto shusshin-de,*
the other day "kururi"-GEN live-to go-PAST-PART. this/?-??that band-TOP Kyoto be-from,
dorama-wo amerikajin-ni kaete ninkikyuujuushouchuu-nanda.
drummer-ACC American-to change-GER be getting popular rapidly.
I went to "Kururi"'s live the other day. They are from Kyoto and getting more and more popular since they change their drummer to an American.

(45) and (46) with *sono-* are judged not so bad by some speakers. However, these seemingly counterexamples do not undermine our generalization. The second sentence of each example tends to be interpreted or have a nuance as if the speaker supposed that the hearer might not know "Daiana" or "Kururi." In these contexts, it is considered that "-toiu" which we discussed in the previous section is added to the antecedents and it makes them indefinites for the speakers who allow *sono-* in (45), (46) (Takubo (1989)). (43), (44) on the other hand do not bear such an assumption, hence only *kono-* (*ano-*) is available.

At any rate, our model provides a proper explanation to the behavior of *ko-/so-* when they are used with proper nouns.

4.3. ~ Ws/ Wp: *ko-/so-

4.3.1. Specific/ Non-specific interpretations

There are some environments under which only *so*-NPs can be used. However, our system does not prevent any NPs from being registered in Ws, for it is to Ws that NPs go from Wo first, and unless they do so, no elements in Wp will be registered. Nonetheless, some sentences seem to always require variable related interpretations, which does not allow us to use Ws. *So*-NPs must be used in such a situation. Let us examine a few examples of this kind of reference.

First, when an antecedent is not, or cannot be specific, only a *so*-NP is used.

- (47) Kyou, kinou-no marason-no shousha-to au-n-dakedo, kono/sono hito-wa hashitte
today, yesterda-GEN marathon-GEN winner-with meet-but, this/that person-TOP run-GER
kuru-souda. Sasuga-wa marason-no senshu-da-ne.
come-I hear. indeed-TOP marathon-GEN player-be-PART.
Today, I am to meet the wineer of the marathon race and I hear that he/she is running here.
He/she is indeed a real runner.

- (48) Raishuu-no marason-no ato, shousha-ni intabyuusuru-kotoninatteiru-n-dakedo, *kono/sono
next week-GEN marathon-GEN after, winner-to have an interview be to but, *this/that
hito-niwa, kokomade hashitte kite-morau-kotoninatteiru-nda-yo.
person-to-TOP here by run-GER come-receive-be to-PART.
I am to have an interview with the winner of the marathon race which is held next week.
The person would have to run here.

In (47), "*sono-hito* (the person)" is supposed to exist already since the marathon has taken place the day before. On the contrary, (48) says that the marathon will be held in the next week, whose winner yet to be specified. This difference between them bears the different behavior of *ko*-NPs. Now, let us consider more subtle examples.

- (49) Taro-wa Toyota-de kuruma-wo utte-iru-ga, sono/*kono kuruma-niwa hoken-wo
Taro-TOP Toyota-at car-ACC sell-GER-be-but, that/*this car-to-TOP insurance-ACC
kake-nakerebanaranai.
insure-must.
Taro sells cars at Toyota. He has to insure those cars.
- (50) Taro-wa Okayama-ni apaato-wo motte-ite, heya-wo kashite-iru-ga, sono/kono
Taro-TOP Okayama-in apartment-ACC have-GER, room-ACC lend-ACC-be-but, that/this

heya-niwa hoken-wo kake-nakerebanaranai.

room-to-TOP insurance-ACC insure-must.

Taro has an apartment and lends the rooms, which he has to insure.

In (49), cars that Taro sells are non-specific. That is, the denotation cannot be determined which cars he should insure. A variable-related interpretation matches in such a situation while "rigid" interpretation does not. On the other hand, in (50) the rooms Taro owns are specific. This is why a *ko*-NP is used as well as a *so*-NP.

We have seen so far in this subsection that when an antecedent is non-specific, *ko*-NP cannot appear. This is because variables should be present for NPs to be properly interpreted. This is confirmed further by looking at examples with *if*-clause (51), (52) below.

- (51) Moshi ano toki takarakuji-ga atatte-itara, *kono/sono kane-wo atamakin-nishite ie-ga
if that time lottery-NOM win-GER-SUBJ, *this/that money-ACC deposit-make house-NOM
kaeta-noni-naa. (Kinsui and Takubo (1990:137), slightly changed)
could buy-PART
If I had won the lottery prize at that time, I could have made a deposit and bought a mansion
with the money.

- (52) Moshi watashi-ni kodomo-ga itara, *kono/sono ko-ni piano-wo oshie-yoo.
if I-LOC child-NOM have-SUBJ, *this/that child-to piano-ACC teach-VOL.
If I had a child, I would teach the piano to him/her.

4.3.2. Bound variables and substitutions

Bound variable interpretations are such that they always call for a function-related interpretation. Since functions always require variables, only elements in *Wp* are used.

- (53) Dono kuni-mo *kono/sono kuni-no hata-wo motte nyuujoushita.
every country-also *this/that country-GEN flag-ACC have-GER enter-PAST
Every country entered with its own flag.
- (54) Dono hon-mo *kono/sono hon-no naiyou-wa totemo yokatta.
every book-also *this/that book-GEN content-TOP very good-PAST
The content of every book was good.

For example, (53) is interpreted when x =Japan, then y =hinomaru (the Rising Sun) and when x =France, then y =tres color. (54) is also explained in the same manner.

Substitutions are another example of a function-related interpretation.

(55) Tyomusukii-to *kono/sono tyosho, "bottyan"-to *kono/sono tyosha

Chomsky-and *this/that writings, "bottyan"-and *this/that author

Chomsky and his writings, "bottyan" and its author

(56) Jikken-wa *kono/sono kekka-ga taisetsu-da.

experiment-TOP *this/that result-NOM important-be

A result is important for any experiment.

Descriptive generalization is well known since Iori (1996) that in these cases only *so*-NPs are allowed (see also Kinsui (1999). Tsutsumi (2002) explores the systematic reason for this fact, by considering the logical representation of such NPs as "*tyosho* (one's writings), *tyosha* (author), *kekka* (result)....etc." Following Tsutsumi (2002), the NPs in (55) (56) are represented as in (57) (58).

(57) $\lambda x (\exists y)$ book-written-by $(x,y) / \lambda x (\exists y)$ author-of (x,y)

(58) $\lambda x (\exists y)$ result-of (x,y)

(57), (58) means that this type of NPs require functional interpretations where variables are needed, which prevent *ko*-NPs from successfully denote the intended individuals.

4.3.3. the "against the prediction" reading

Iori (1996) points out one more case where only *so*-NPs can be used. He calls such a type of sentences the "against the prediction" reading (*yosoku uragiri*). Again in (59) (60), *so*-NPs, not *ko*-NPs, are used.

(59) Junko-wa "anata-nashide-wa iki-rarenai"-to itte-ita. Sono/*kono Junko-ga

Junko-TOP you-without-TOP live-cannot that was-saying. That/*this Junko-NOM

ima-wa hoka-no otoko-no kodomo-wo hutari-mo unde-iru.

now-TOP another-GEN man-GEN child-ACC two-PART bear-GER-be.

Junko used to say that she could never live without me. However, she now has two children by another man.

(60) Taro-wa asanebou-de mettani asagohan-wo tabenai.

Taro-TOP late riser-DEC rarely breakfast-ACC eat-NEG

Kesa, sono/*kono Taro-ga asagohan-wo tabeta.

this morning, that/*this Taro-NOM breakfast-ACC eat-PAST

Taro is a late riser and seldom has breakfast. However, he ate it this morning.

(ibid.:34)

Iori (1996) claims that in such cases, *so*-NPs takes the previous information obligatorily, which cancels the use of *ko*-NPs. For example, for the second sentence in (59) to make sense, "Junko" should have a property that she used to say to the speaker of (59) that she could not live without him. So what makes *so*-NPs to have such an information obligatorily is the fact that the content of the second sentence says the contrary fact to what the first sentence has just mentioned. This analysis of Iori (1996)'s is correct.

From our point of view, Iori's discussion suggests that "Junko" in the first sentence denotes a different element from that in the second sentence. That is, "Junko" in the first sentence denotes the individual level of "Junko," whereas, "Junko" in the latter denotes a stage-level of "Junko," a stage where she used to say what she said in the first sentence in (59). Now, following Carlson (1977), let us assume a relation (R) which transfers an individual level predicate (x^i) into a stage level predicate (y^s). This is written as in (61).

(61) $R[y^s, x^i]$

When we interpret the second sentence such as in (59) or (60), this relation is called for. This assumption predicts that only *so*-NPs can be used, which suits the fact presented in Iori (1996).

5.concluding remarks

In this paper I presented a model which is capable of explaining the functions of the demonstratives in non-deictic use. *Ko*/*A*-NPs refer to elements registered in *Ws* (D-indexed NPs in Ueyama (1998)'s sense), while *so*-NPs refer to those in *Wp* (variables). This prediction is successfully borne out after observing the various data in the section 4.

There are two further questions to be explored: i) if this model is applicable to deictic use, ii) if this model is applicable to analysis of other languages. About the question i), I would say yes. In deictic use, *so*-NPs appear only when an element is closer to the hearer or when an element is neither close nor far from both the speaker and the hearer. If a research finds some point in

common between these two usages, then it can explain the demonstratives in deictic use in our theory. This in turn combines non-deictic and deictic use. One of the possibilities is seen in Tsutsumi (2005). At any rate, the point of view which I have shown in this paper seems to be on the right track.

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